

What is claimed is:

1. An optical switching subsystem comprising:

a plurality of input optical ports for inputting an optical signal;

a plurality of output optical ports for outputting the optical signal;

an optical switch formed by a micro electromechanical system (MEMS) for switching an optical path among said input optical ports and said output optical ports;

a controller for instructing said optical switch to execute switching operation; and

self-diagnosis means for measuring performance characteristics of said optical switching subsystem and diagnosing said optical switching subsystem based upon said performance characteristics.

2. The optical switching subsystem according to claim 1, wherein said performance characteristics are switching time of the optical path.

3. The optical switching subsystem according to claim 1, wherein said performance characteristics are control input value for inputting to said optical switch or a state variable of said controller used for calculating said control input value.

4. The optical switching subsystem according to claims 1, wherein said self-diagnosis means notifies a host system of a result of self-diagnosis.

5. The optical switching subsystem according to claim 1, wherein said self-diagnosis means ranks said performance characteristics and notifies a host system of ranking information.

6. The optical switching subsystem according to claim 1, wherein said self-diagnosis means is operated without an instruction from a host system.

7. An optical switching subsystem comprising:

a plurality of input optical ports for inputting an optical signal;

a plurality of output optical ports for outputting the optical signal;

an optical switch formed by a micro electromechanical system (MEMS) for switching an optical path among said input

optical ports and said output optical ports;
a controller for instructing said optical switch to
execute switching operation; and
calibration means for calibrating control over the
operation of said optical switch.

8. The optical switching subsystem according to claim 7,
said calibration means comprises compensating means for
calculating a controller output correction value.

9. The optical switching subsystem according to Claim 7,
wherein said calibration means comprises gain
compensating means for compensating converting correction gain
between control input and control output of the optical switch.

10. The optical switching subsystem according to claim 7,
said calibration means is executed when the optical
switching subsystem is activated and every predetermined time
without an instruction from a host system.

11. An optical switching subsystem comprising:
a plurality of input optical ports for inputting an
optical signal;
a plurality of output optical ports for outputting the
optical signal;
an optical switch formed by a micro electromechanical
system (MEMS) for switching an optical path among said input
optical ports and said output optical ports;
a controller for instructing said optical switch to
execute switching operation;
self-diagnosis means for measuring performance
characteristics of said optical switching subsystem and
diagnosing said optical switching subsystem based upon said
performance characteristics; and
calibration means for calibrating control over the
operation of said optical switch.

12. The optical switching subsystem according to Claim 11,
wherein said calibration means comprises compensating
means for calculating a controller output correction value
and said self-diagnosis means operates based upon said
controller output correction value.

13. The optical switching subsystem according to Claim 11,
wherein said calibration means comprises gain
compensating means for compensating converting correction gain

between control input and control output of the optical switch and said self-diagnosis means operates based upon said converting correction gain.

5 14. The optical switching subsystem according to claim 11,
 wherein the calibration means operates when the self-
 diagnosis means determines that a corresponding reflecting
 mirror of the optical switch fails based on measured performed
 characteristics.

10 15. The optical switching subsystem according to Claim 14,
 wherein the self-diagnosis means operates again after the
 calibration is executed by the calibration means, and
 the self diagnosis means notifies a host system when it
15 is diagnosed at that time that the corresponding reflecting
 mirror fails.

20 16. An optical switching subsystem comprising:
 a plurality of input optical ports for inputting an
 optical signal;
 a plurality of output optical ports for outputting the
 optical signal;
 an optical switch formed by a micro electromechanical
 system (MEMS) for switching an optical path among said input
25 optical ports and said output optical ports;
 a subsystem controller circuit for controlling said
 optical switching subsystem;
 a switching module controller circuit for controlling
 said optical switch;
30 a memory connected to said subsystem controller and said
 switching module controller, for storing control parameters
 related to said optical switch;
 a monitor for outputting a signal to the subsystem
 controller according to said output signal.

35 17. An optical communication system comprising:
 said optical switching subsystem according to claim 16,
 a host system said host system recurring information
 related said optical switch from said optical switching
40 subsystem.

45 18. The optical switching subsystem according to claim 16,
 comprising a ranking circuit for determining ranks of
 operation of switching elements.

19. The optical switching subsystem according to claim 16,

comprising a feedback control circuit for feedback controlling.

5 20. The optical switching subsystem according to claim 19,
 wherein said feedback control circuit includes said
 memory, a controlled object for outputting control output, a
 controller for outputting output of controller to said
 controlled object, and a comparator for comparing said control
 output with reference value from said memory.

10 21. The optical switching subsystem according to claim 20,
 wherein said feedback control circuit further includes a
 controller output compensator for outputting controller output
 correction value, a signal adder for adding the output of
15 controller and the controller output correction value, and a
 gain compensator for outputting control input to said
 controlled object.

20 22. An optical switching subsystem self-diagnosing method
 comprising:
 monitoring an intensity of an optical signal in an output
 optical port;
 calculating a control voltage for controlling an optical
 switch according to at least said intensity of said optical
25 signal;
 controlling a mirror of the optical switch;
 determining ranks of operation of plural mirrors in said
 optical switch.

30 23. The optical switching subsystem self-diagnosing method
 according to claim 22,
 further comprising
 reading data for calculating said control voltage and
 storing data acquired said operation of said optical
35 switch.

40 24. The optical switching subsystem self-diagnosing method
 according to claim 22,
 further comprising
 notifying a host system of information related to said
 ranks.

45 25. The optical switching subsystem self-diagnosing method
 according to claim 22,
 further comprising
 compensating said control voltage.